# Chapter 6: Repair & Replacement

**6.1 Overview ..... 6-3**

**6.2 BiPAP Synchrony System Repair Kits ..... 6-5**

**6.3 Warnings and Cautions ..... 6-9**

**6.4 Replacement Instructions ..... 6-9**

( This page left intentionally blank. )

# Chapter 6: Repair & Replacement

## 6.1 Overview

Figure 6-1 lists the names and identifies the locations of the replaceable components in the BiPAP Synchrony System. The exploded view provides a quick reference and overview of the unit. Within each replacement section, more detailed support information is provided to illustrate the exact component location and replacement procedure(s).

**CAUTION:** Due to required calibration after parts replacement, the following may not be field replaced unless the unit is Final Tested at a Respironics Service Center equipped with a Multi Functional Calibration Station.

- Main Printed Circuit Assembly (Main PCA)
- Power Supply Printed Circuit Assembly
- Blower Assembly
- Enclosure Insert
- Pressure Tubing
- Mass Flow Sensor Tubing
- Valve Assembly
- Flow Element
- Flow Averaging Rings
- Temperature Circuit

For technical assistance or replacement part ordering information contact Respironics World Wide Technical Service.

**U.S. and Canada**

**Phone:** **1-800-345-6443**
**Fax:** **1-800-422-5816**

**International**

**Phone:** **1-412-631-2100**
**Fax:** **1-412-463-5012**

Visit Respironics Home Page on the World Wide Web at:

**www.respironics.com**

## 6.1.1 BiPAP Synchrony System Exploded View

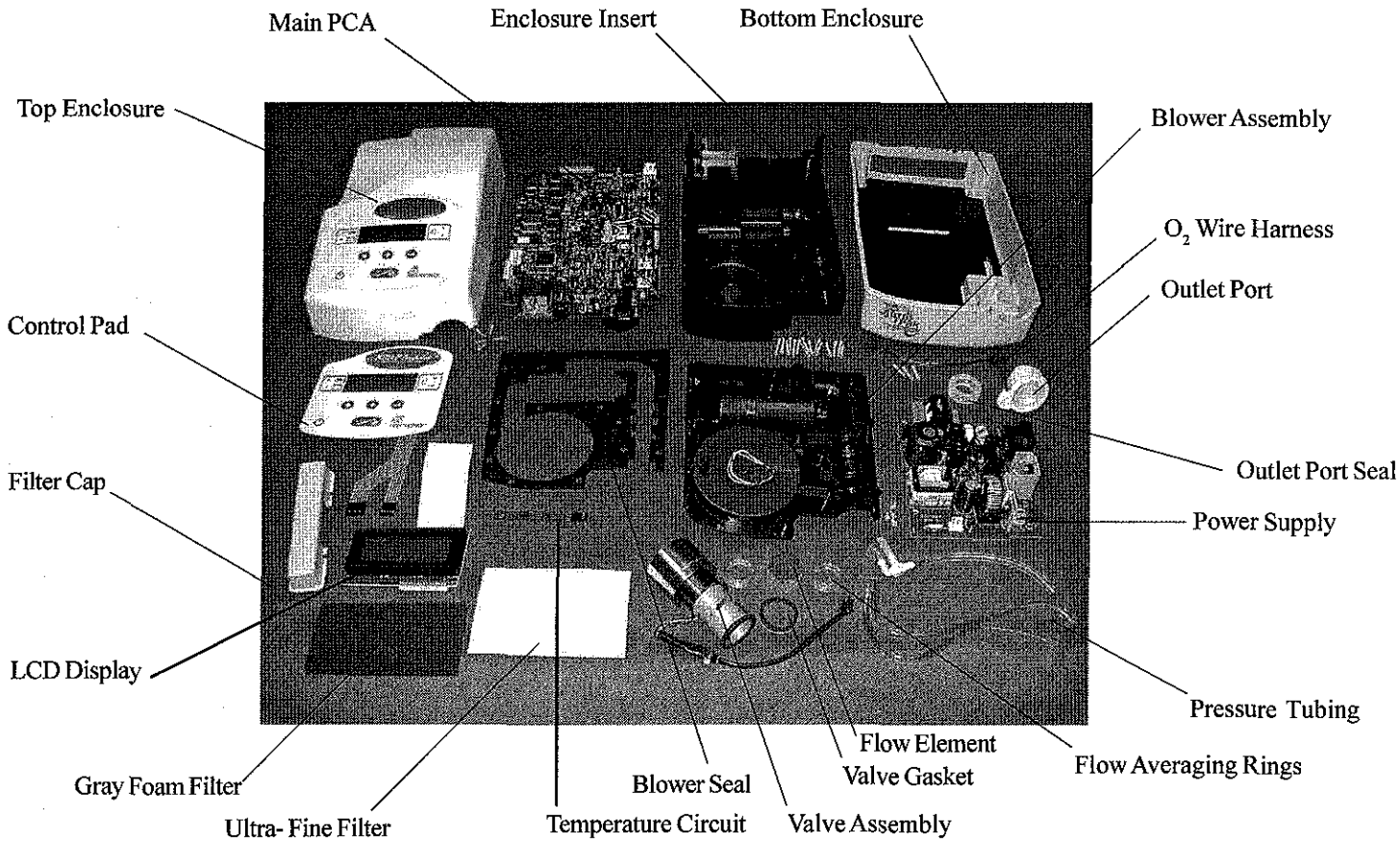



*Figure 6-1*
*BiPAP Synchrony System Exploded View*

# 6.2 BiPAP Synchrony System Repair Parts

| Replacement Part | Replacement Part No. | Page No. |
|---|---|---|
| AC Power Cord | 622243<br>See Note[2] | N.A. |
| Blower Assembly<br>Includes • Blower Assembly<br>• Blower - to - enclosure insert seal.<br>• Flow Element / Flow Averaging Rings<br>• 6 - 13 x 3/4″ screw (x15) | 622187<br>See Note[1] | 6-35 |
| Bottom Enclosure<br>Includes • Bottom Enclosure ( with bottom strip)<br>• 8 - 18 Hi - Lo x 3 / 4″ screw (x5)<br>• Accessory Cover | 1003513<br>See Note[1] | 6 - 12 |
| Control Pad | 1003519 | 6 - 21 |
| Display Assembly<br>Includes: • LCD | 1003520 | 6 - 18 |

*BiPAP Synchrony System Repair Kits (Continued)*

| Replacement Part | Replacement Part No. | Page No. |
|---|---|---|
| DC Power Cord (Shielded) (optional) | 1001956 | N.A. |
| Enclosure Insert<br>Includes • Enclosure Insert<br>• Blower to Enclosure Insert Seal | 622184 | 6 - 48 |
| Filter, Disposable, Ultra-fine (x6) | 622219 | N.A. |
| Filter, Reusable, Gray Foam (x2) | 622220 | N.A. |
| Filter Cap | 1000344 | N.A. |
| Filter Kit<br>Includes: • Filter, Disposable, Ultra-fine (x6)<br>• Filter, Reusable, Gray Foam (x2) | 622221 | N.A. |
| Main Printed Circuit Assembly (Main PCA with modem)<br>Includes: • Main PCA<br>• 6 - 19 x 3 / 8″ screw (x5) (Plastite 48 - 2) | 1003518<br>See Note [1] | 6 - 24 |

*BiPAP Synchrony System Repair Kits (Continued)*

| Replacement Part | Replacement Part No. | Page No. |
|---|---|---|
| $O_2$ Enrichment Port (Used for Testing) | 312010 | A - 3 |
| Outlet Port<br>Includes • Outlet Port<br>• Outlet Port Seal | 1000346 | 6 - 32 |
| Power Supply Printed Circuit Assembly<br>Includes • Power Supply PCA<br>• 6 - 13 x 1 / 4″ screw (x4) | 1002071 | 6 - 44 |
| Pressure Tubing Kit<br>Includes: • Pressure Tubing (5″) x 1<br>• Mass Flow Sensor Tubing (9″) x 2 | 1003517 | 6 - 29 |
| Test Orifice | 622244 | N.A. |
| Temperature Circuit | 1003522 | 6 - 49 |

*BiPAP Synchrony System Repair Kits (Continued)*

| Replacement Part | Replacement Part No. | Page No. |
|---|---|---|
| Main Printed Circuit Assembly (Main PCA without modem)<br>Includes: • Main PCA<br>• 6 - 19 x 3 / 8" screw (x5) (Plastite 48 - 2) | 1004052 | |
| Top Enclosure (with modem port)<br>Includes • Top Enclosure<br>• 8 - 18 Hi - Lo x 3 / 4" Screw (x3) | 1003514 | 6 - 14 |
| Top Enclosure (without modem port)<br>Includes • Top Enclosure<br>• 8 - 18 Hi - Lo x 3 / 4" Screw (x3) | 1003523 | 6 - 14 |
| Valve Assembly<br>Includes • Valve Assembly<br>• Blower - to - Enclosure Insert Seal<br>• Flow Element<br>• Flow Averaging Rings | 622242 | 6 - 40 |
| Synchrony Service Manual | 1003512 | N.A. |
| Oxygen Module | 1000348 | N.A. |

*BiPAP Synchrony System Repair Kits (Continued)*

**Comments:**

- Illustration is shown on page 6 - 4
- All items have a quantity of one unless otherwise specified.
- Part replacement procedures are detailed within this chapter.
- Assorted tubing, cables, and hardware are supplied with each Replacement Kit.

**Note 1:**

- Due to required testing after replacement, these items are only replaceable at a Respironics Service Center equipped with a Multi Functional Calibration Station.

**Note 2:**

- Contact Respironics International Customer Service for further AC Power Cord Information

**Note 3:**

- Contact Respironics Worldwide Technical Service for bottom enclosure information.

**Note 4:**

- This item is optional for this unit. See chapter 8 for option installation instructions.

## 6.3 Warnings and Cautions

**WARNING:** To prevent electrical shock, disconnect the electrical supply before attempting to make any repairs to the Synchrony system.

**CAUTION:** Electronic components used in this unit are subject to damage from static electricity. Repairs made to this unit must be performed only in an antistatic, Electro-Static Discharge (ESD) - protected environment.

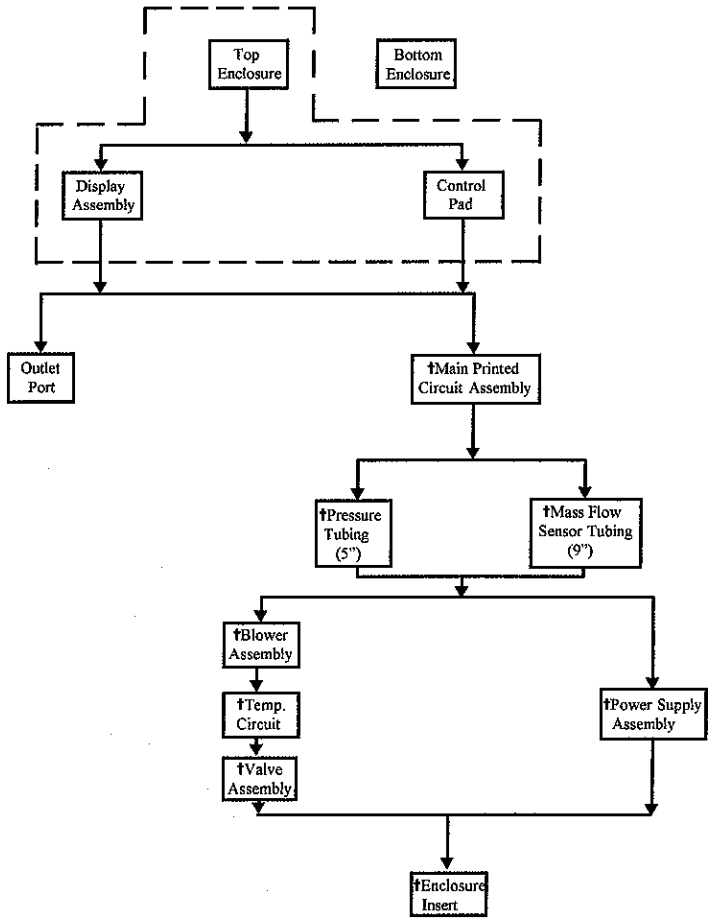
**CAUTION:** Due to required calibration after parts replacement, the following may not be field replaced unless the unit is System Final Tested on a Multi-Functional Calibration Station.

- Main Printed Circuit Assembly
- Power Supply Printed Circuit Assembly
- Blower Assembly
- Enclosure Insert
- Pressure Tubing
- Mass Flow Sensor Tubing
- Valve Assembly
- Flow Element
- Flow Averaging Rings
- Temperature Circuit

## 6.4 Replacement Instructions

See Figures 6-2 and 6-3 before removing or installing any component. These figures will detail the order in which each item must be removed or installed and should be used as a guideline for quick reference.

*Replacement Instructions (Continued)*




## Removal Flow Chart

***Figure 6-2***
***Removal Flow Chart***

Chart Usage: Determine which item is to be replaced then follow the line of flow back to the "Top Enclosure" and begin the removal process. Detailed procedures begin on the referenced page numbers.

**† Caution:** Due to required testing after replacement, these items are only replaceable at a Respironics Service Center equipped with a Multi Functional Calibration Station.

## 6.4.1 Bottom Enclosure Replacement

### Replacement Part Number (See Note[3] on page 6-8)

| Included in kit: | Tools Required: |
|---|---|
| Bottom enclosure (w / bottom strip)<br>8-18 Hi - Lo x 3/4" screw (x5)<br>Accessory cover | Phillips screwdriver (medium) |

### Procedure

Removed / Installed During Process:

- Bottom Enclosure

**WARNING:** Electrical shock hazard: Disconnect the electrical supply before attempting to make any repairs to the device.

**CAUTION:** Electronic components used in this device are subject to damage from static electricity. Repairs made to this device must be performed only in an antistatic, ESD-protected environment.

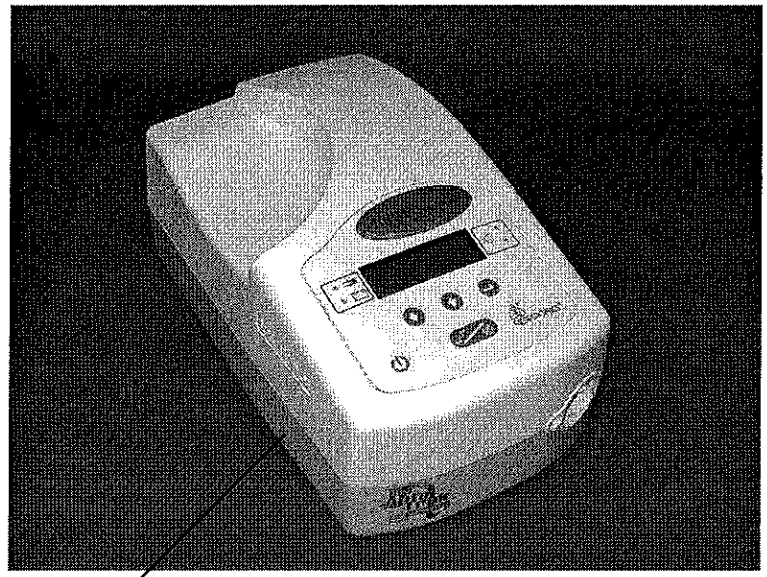



*Figure 6-3*
*Bottom Enclosure*

*Bottom Enclosure Replacement (Continued)*

*Step 1* *Removing the Bottom Enclosure*

a. Place the unit upside down on a protected work surface.

b. Remove the two screws that attach the accessory cover to the bottom enclosure.

c. Using a Phillips screwdriver, remove the three screws that secure the bottom enclosure to the top enclosure.

d. Lift the bottom enclosure from the rest of the unit.

e. Carefully, and away from the unit , turn the bottom enclosure over and remove the screws.

*Step 2* *Installing the Bottom Enclosure*

a. Ensure that the outlet port is still properly seated in the bottom enclosure.

b. Align and place the bottom enclosure onto the enclosure insert.

c. Ensure that the bottom enclosure is properly seated in the top enclosure and the outlet port.

d. Install and secure the three mounting screws.

e. Align the accessory cover with the bottom enclosure.

f. Install and secure the two mounting screws.

g. Carefully return unit to upright position.

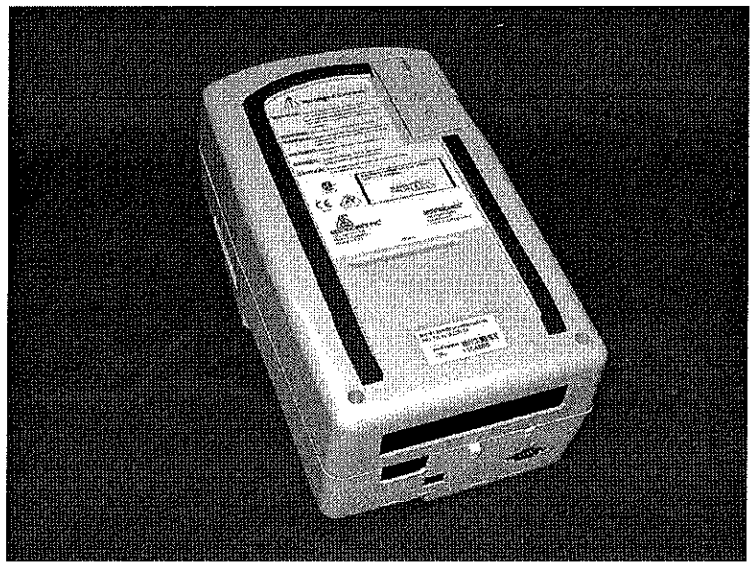


***Figure 6-4***
***Removing the Bottom Enclosure Screws***

## 6.4.2 Top Enclosure Replacement

**Replacement Part Number 1003514 (with modem port)**
**Replacement Part Number 1003523 (without modem port)**

| Included in Kit: | Tools Required |
|---|---|
| Top Enclosure<br>8-18 Hi - Lo x 3/4" screw (x5) | Phillips screwdriver No# 2 (medium) |

### Procedure

Removed / Installed During Process:

- Top Enclosure
- Display Assembly
- Control Pad

**WARNING:** Electrical shock hazard: Disconnect the electrical supply before attempting to make any repairs to the device.

**CAUTION:** Electronic components used in this device are subject to damage from static electricity. Repairs made to this device must be performed only in an antistatic, ESD-protected environment.

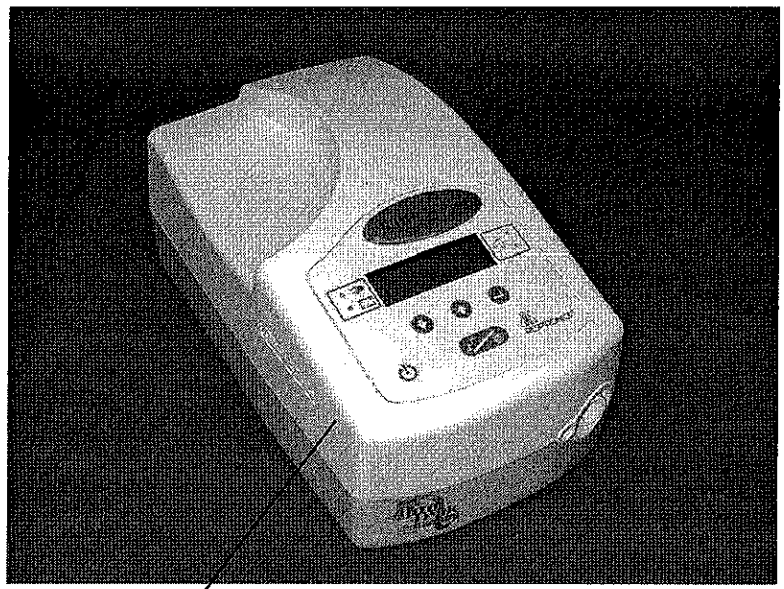



*Figure 6-5*
*Top Enclosure*

*Top Enclosure Replacement (Continued)*

*Step 1 Removing the Top Enclosure*

a. Place the unit on a protected work surface and carefully turn it over, exposing the bottom.

b. Using a Phillips No# 2 screwdriver, remove the three screws that secure the top enclosure to the bottom enclosure.

c. While securely holding the top and the bottom enclosure together, carefully return the unit to its upright position.

d. Partially separate the top enclosure from the bottom enclosure.

**NOTE:** The top enclosure is still connected to the unit via the display assembly ribbon cable and the control pad ribbon cable. These will be removed during the following steps.

e. Lift the top enclosure and hold it slightly above the unit to provide access to the control pad ribbon cable and the display assembly ribbon cable connections on the Main Printed Circuit Assembly (Main PCA).

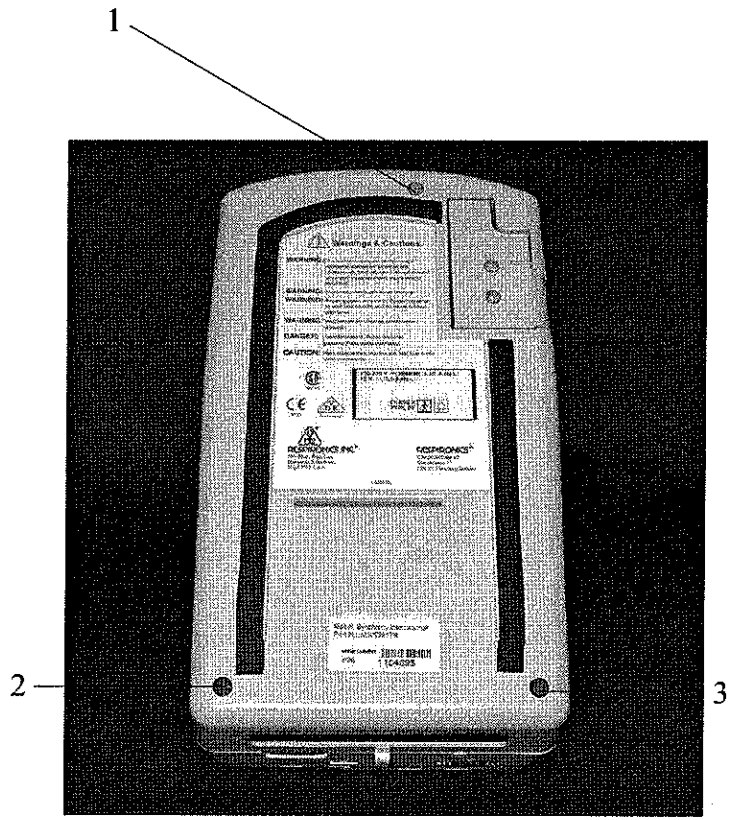



***Figure 6-6***
***Location of the screws***

*Top Enclosure Replacement (Continued)*

f. Remove the control pad ribbon cables and the display assembly ribbon cable connectors by gently pulling them straight out from their receptacles on the Main PCA. The top enclosure is now free from the rest of the unit.

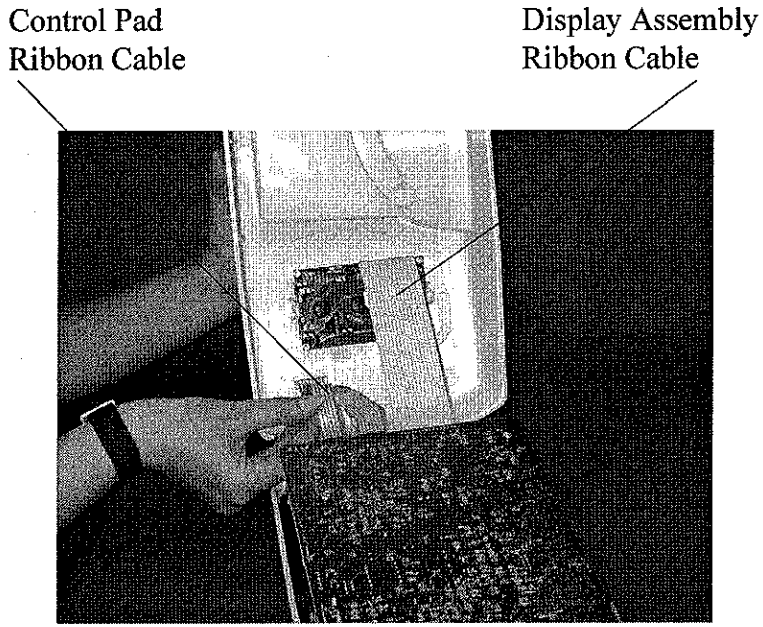



***Figure 6-7***
***Removing the Control Pad Ribbon Cable and Display Assembly Ribbon Cable***

*Step 2 Removing the Display Assembly*

Remove • display assembly

(See Section 6.4.3 for more detailed instructions on removing the display assembly.)

*Step 4 Installing the Control Pad*

Install • control pad

(See Section 6.4.4 for more detailed instructions on installing the control pad.)

*Step 5 Installing the Display Assembly*

Install • display assembly

(See Section 6.4.3 for more detailed instructions on installing the display assembly.)

*Top Enclosure Replacement (Continued)*

*Step 6 Installing the Top Enclosure*

a. Ensure that the outlet port is still properly seated in the bottom enclosure.

b. While holding the top enclosure slightly above the unit, align the display assembly ribbon cable pins with their receptacle on the Main PCA. Press the cable into the receptacle until completely seated.

c. Still holding the top enclosure slightly above the unit, align control pad ribbon cable connectors with its receptacle on the Main PCA. Press the cable into the receptacle until completely seated.

d. Align the top enclosure with the bottom enclosure and outlet port then set in place.

e. While securely holding the top and bottom enclosure together, carefully turn the unit upside down.

f. Insert and tighten the three Phillips screws to secure the top enclosure to the bottom enclosure.

g. Return the unit to its upright position.

## 6.4.3 Display Assembly Replacement

### Replacement Part Number 1003520

| Included in Kit: | Tools Required: |
|---|---|
| Display PCA<br>LCD | Phillips screwdriver (medium) |

### Procedure

Removed / Installed During Process

- Top Enclosure
- Display assembly

**WARNING:** Electrical shock hazard: Disconnect the electrical supply before attempting to make any repairs to the device.

**CAUTION:** Electronic components used in the device are subject to damage from static electricity. Repairs made to this device must be performed only in an antistatic, ESD-protected environment.

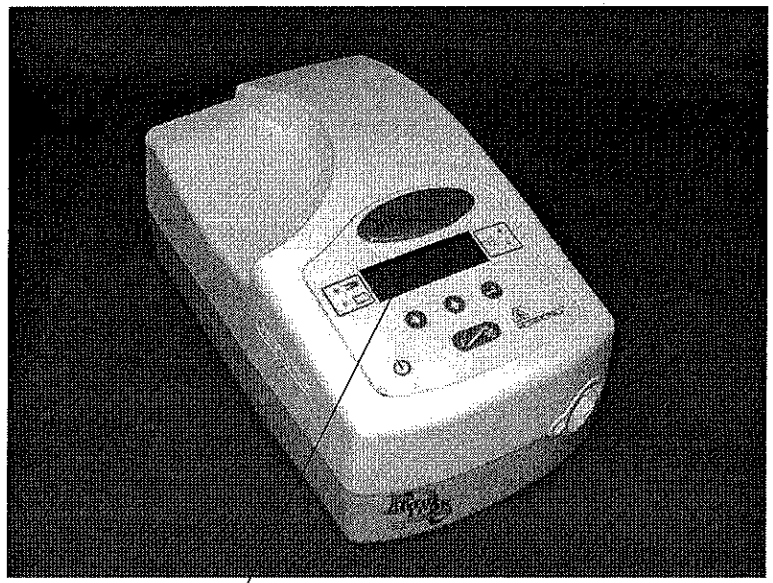



***Figure 6-8***
***Display Assembly***

*Display Assembly Replacement (Continued)*

*Step 1 Removing the Top Enclosure*

Remove
- three screws
- top enclosure

(See Section 6.4.2 for more detailed instructions on removing the top enclosure.)

*Step 2 Removing the Display Assembly*

a. Place the top enclosure on a protected work surface and carefully turn it over, exposing the underside.

b. Move the display assembly locking tabs away from the display assembly then lift the display assembly straight up from the top enclosure.

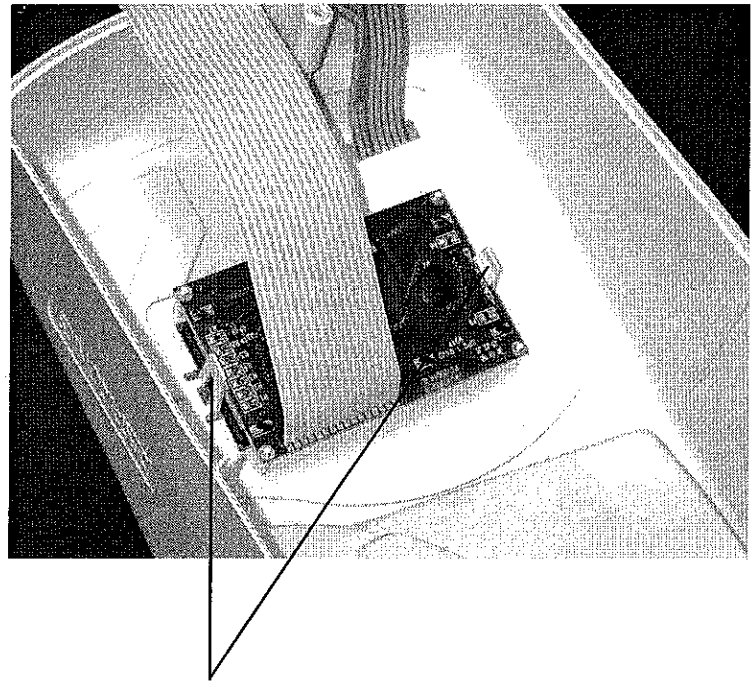



***Figure 6-9***
***Location of the Display Assembly Locking Tabs***

*Display Assembly Replacement (Continued)*

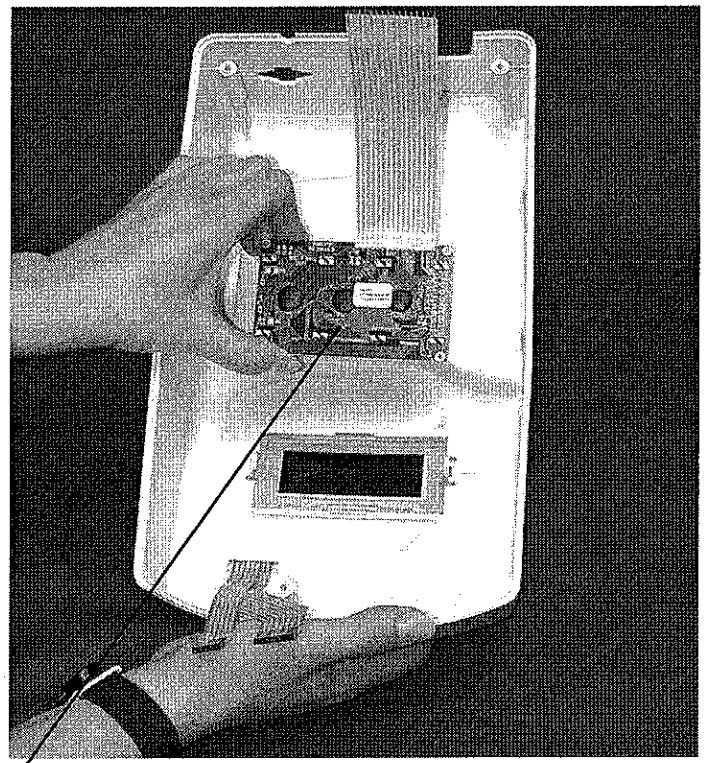



***Figure 6-10***
***Removing the Display Assembly***

*Step 3 Installing the Display Assembly*

a. Align the display assembly with the four mounting posts and gently press into the top enclosure until the locking tabs "snap" into place. Note that the ribbon cable side of the display assembly must point towards the back of the top enclosure.

*Step 4 Installing the Top Enclosure*

Install:
- top enclosure
- three screws

(See Section 6.4.2 for more detailed instructions on installing the top enclosure.)

## 6.4.4 Control Pad Replacement

### Replacement Part Number 1003519

| Included in Kit: | Tools Required: |
|---|---|
| Control Pad | Phillips screwdriver No#2 (medium)<br>Flat-blade screwdriver No#1 (small)<br>Isopropyl alcohol<br>Cleaning cloth |

### Procedure

Removed / Installed During Process:

- Top Enclosure
- Control Pad

**WARNING:** Electrical shock hazard: Disconnect the electrical supply before attempting to make any repairs to the device.

**CAUTION:** Electrical components used in this device are subject to damage from static electricity. Repairs made to this device must be performed only in an antistatic, ESD-protected environment.

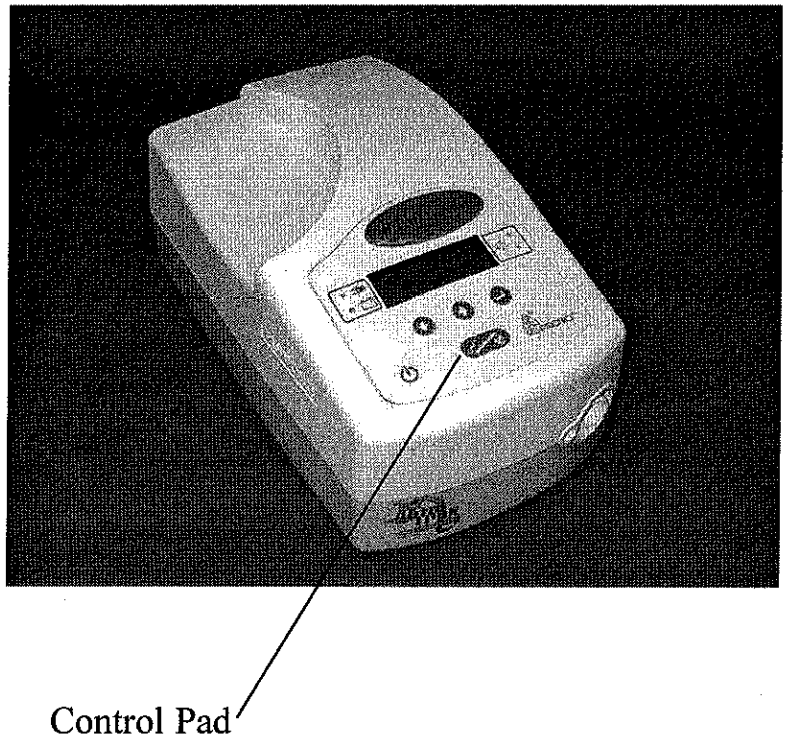



*Figure 6-10*
*Control*

*Control Pad Replacement (Continued)*

*Step 1 Removing the Top Enclosure*

Remove
- three screws
- top enclosure

(see Section 6.4.2 for more detailed instructions on removing the top enclosure.)

*Step 2 Removing the Control Pad*

a. Working from the inside of the top enclosure, place a flat-blade screwdriver onto the exposed portion of the control pad, next to the ribbon cable. Gently push until the control pad is partially lifted.

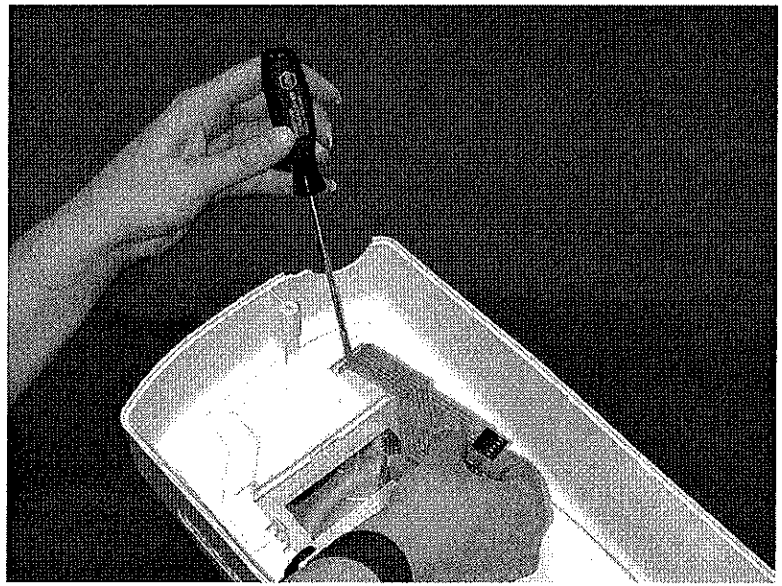


***Figure 6-11***
***Pressing the Control Pad from the Top Enclosure***

*Control Pad Replacement (Continued)*

b. Working from the outside of the top enclosure, carefully lift upwards on the control pad and remove it from the top enclosure.

**NOTE:** A small amount of isopropyl alcohol may be used during the removal process.

c. As the control pad is being removed, the ribbon cable must be fed through the opening in the top enclosure.

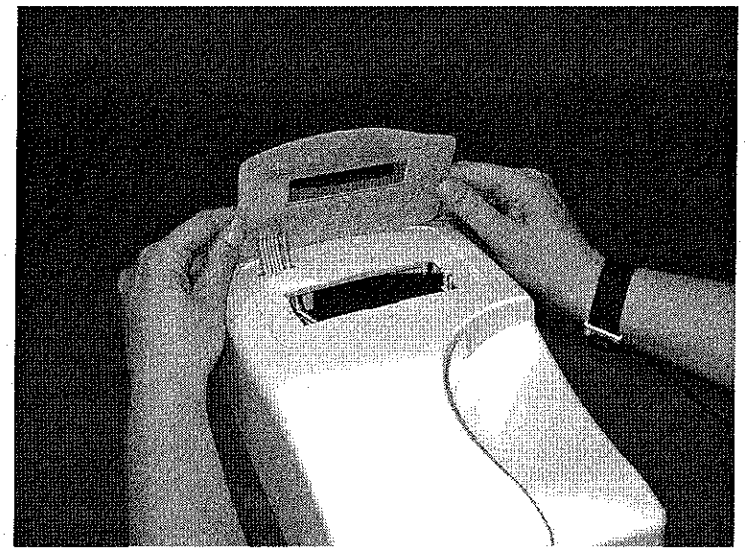


***Figure 6-12***
***Removing the Control Pad***

d. Use a small amount of isopropyl alcohol on a cleaning cloth to remove any adhesive residue from the surface of the top enclosure.

### *Step 3 Installing the Control Pad*

a. Remove the protective backing from the back of the control pad (make sure the backing under the ribbon cable is removed.)

b. Feed the control pad ribbon cable through the opening in the top enclosure

c. Starting with the front edge, align the control pad with the indentation in the top enclosure then set in place.

d. Using a rubbing motion, press the control pad firmly onto the top enclosure.

### *Step 4 Installing the Top Enclosure*

Install
- top enclosure
- three screws

(See Section 6.4.2 for more detailed instructions on installing the top enclosure.)

## 6.4.5 Main Printed Circuit Assembly (Main PCA) Replacement

**CAUTION:** Due to required testing after replacement, this item is only replaceable at a Respironics Service Center equipped with a Multi Functional Calibration Station.

### Replacement Part Number 1003518

| Included in Kit: | Tools Required: |
|---|---|
| Main PCA<br>6-19 x 3/8" Plastite screw (x5) | Phillips screwdriver No#2 (medium) |

### Procedure

Removed / Installed During Process

- Top enclosure assembly
- Main PCA

**WARNING:** Electrical shock hazard: Disconnect the electrical supply before attempting to make any repairs to the device.

**CAUTION:** Electronic components used in this device are subject to damage from static electricity. Repairs made to this device must be performed only in an antistatic, ESD-protected environment.

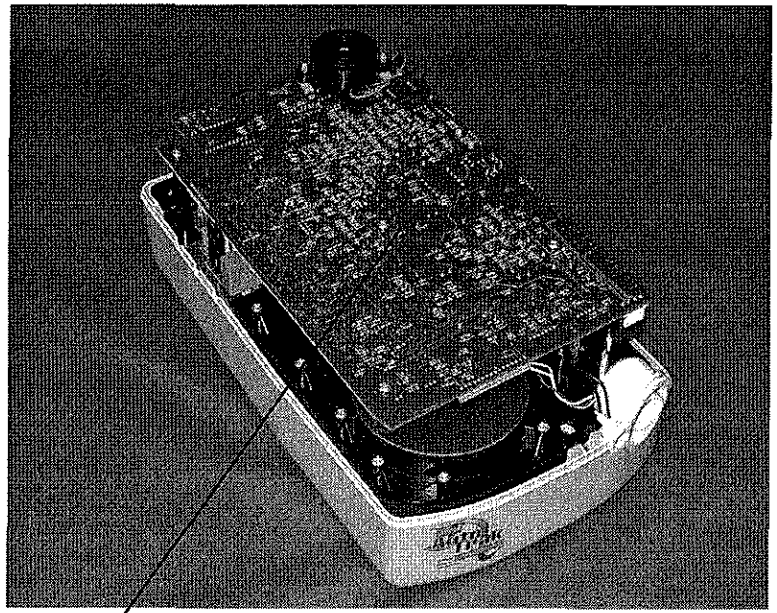



*Figure 6-13*
*Main Printed Circuit Assembly*

*Main PCA Replacement (Continued)*

*Step 1 Removing the top Enclosure*

a. Place the unit on a protected work surface and carefully turn it over, exposing the bottom.

b. Using a Phillips screwdriver, remove the three screws that secure the top enclosure to the bottom enclosure.

c. While holding the unit together, return it to the normal position.

d. Slightly lift the top enclosure assembly from the unit to provide access to the control pad ribbon cables and the display ribbon cable connections on the Main PCA.

e. Remove the control pad ribbon cables and the display assembly ribbon connectors by gently pulling straight out from their receptacles.

f. The top enclosure assembly is now free from the rest of the unit.

(See Section 6.4.2 for more detailed instructions on installing the top enclosure.)

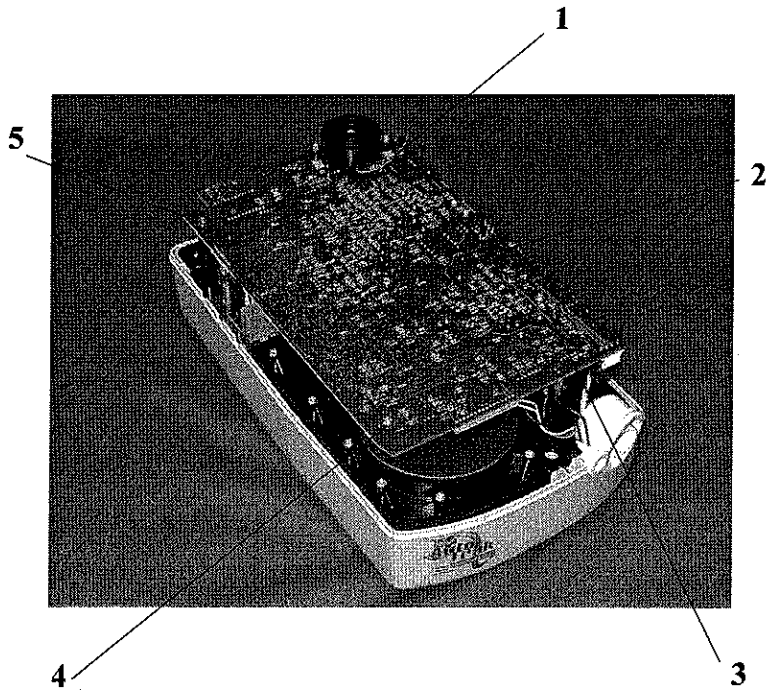



***Figure 6-14***
***Location of the Five Screws Securing the Main PCA***

*Main PCA Replacement (Continued)*

*Step 2 Removing the Main PCA*

a. Using a Phillips screwdriver, remove the five screws securing the Main PCA to the standoffs on the enclosure insert.

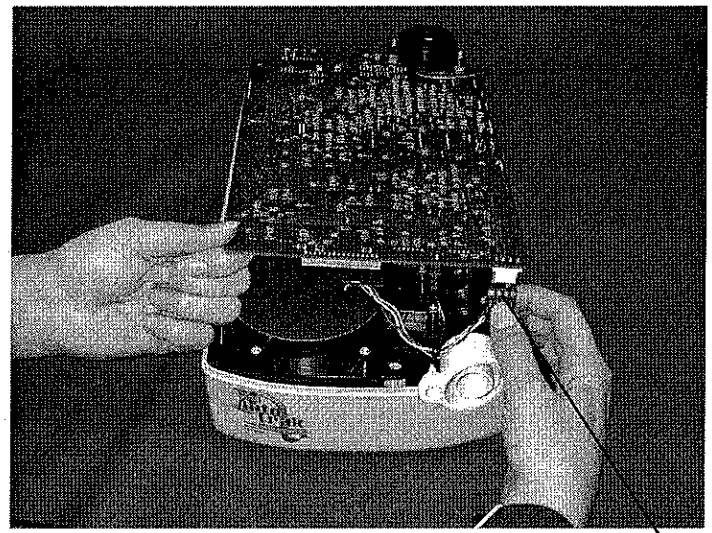



***Figure 6-15***
***Removing the blower Wire Connector from the (J2) Location***

b. Lift the Main PCA slightly to provide access to the pressure tubing, blower, and power supply connections.

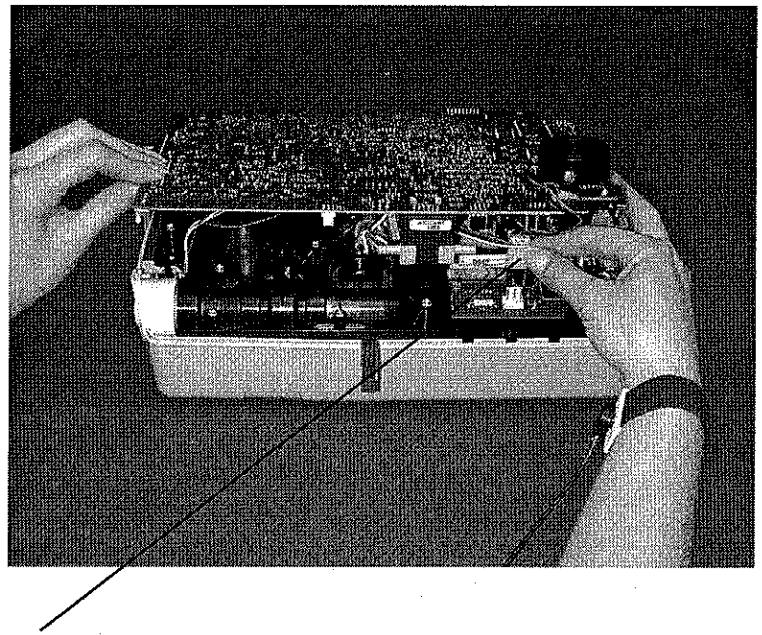



***Figure 6-16***
***Removing the Power Supply Connector from the (J2) Location***

*Main PCA Replacement (Continued)*

c. Remove the blower wire connector from the (J2) location on the Main PCA by pulling it straight down from the receptacle.

d. Remove the power supply connector from the (J2) location on the Power Supply Printed Circuit Assembly by pulling straight up from the receptacle.

e. Remove the valve connector from the (J4) location on the Main PCA.

f. Remove the Oxygen Module wire harness connector from the (J16) location on the Main PCA.

g. Remove the temperature circuit connector from the (J14) location on the Main PCA.

h. Remove the two pieces of 9" mass flow sensor tubing from the MT1 location on the Main PCA.

i. Remove the two pieces of pressure tubing from MT2 and MT4 location on the Main PCA.

j. The Main PCA is now free from the rest of the unit.

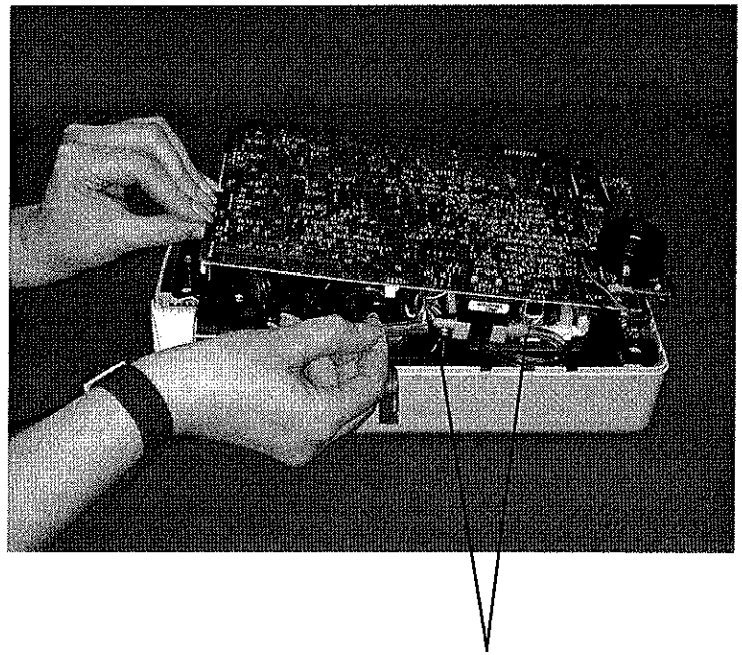



***Figure 6-17***
***Removing the Mass Flow Sensor Tubing***

*Main PCA Replacement (Continued*

*Step 3 Installing the Main PCA*

a. Connect the two 9' pieces of tubing to MT1.

b. Connect the two pieces of tubing to MT2 and MT4.

c. Install the valve assembly connector to the (J4) location the Main PCA.

d. Install the blower wire connector to the (J2) location on the Main PCA.

e. Install the temperature circuit connector to the (J14) location on the Main PCA.

f. Install the oxygen module wire harness to the (J16) location on the Main PCA.

g. Secure the Main PCA to the enclosure insert by installing and tightening the five screws provided.

*Step 4 Installing the Top Enclosure*

Install
- top enclosure
- three screws

(See Section 6.4.2 for more detailed instructions on installing the top enclosure.)

## 6.4.6 Pressure and Mass Flow Sensor Tubing Replacement

**CAUTION:** Due to required testing after replacement, this item is only replaceable at a Respironics Service Center equipped with a Multi Functional Calibration Station.

### Replacement Part Number 1003517

| Included in Kit: | Tools Required: |
|---|---|
| Pressure tubing (5") x 1<br>Pressure tubing (1") x 2<br>Plastic (F) fitting<br>Mass flow sensor tubing (9") x 2 | Phillips screwdriver No#2 (medium) |

### Procedure

Removed / Installed During Process

- Top Enclosure Assembly
- Main PCA
- Mass flow sensor tubing
- Pressure tubing

**WARNING:** Electrical shock hazard: Disconnect the electrical supply before attempting to make any repairs to the device.

**CAUTION:** Electronic components used in this device are subject to damage from static electricity. Repairs made to this device must be performed only in an antistatic, ESD-protected environment.

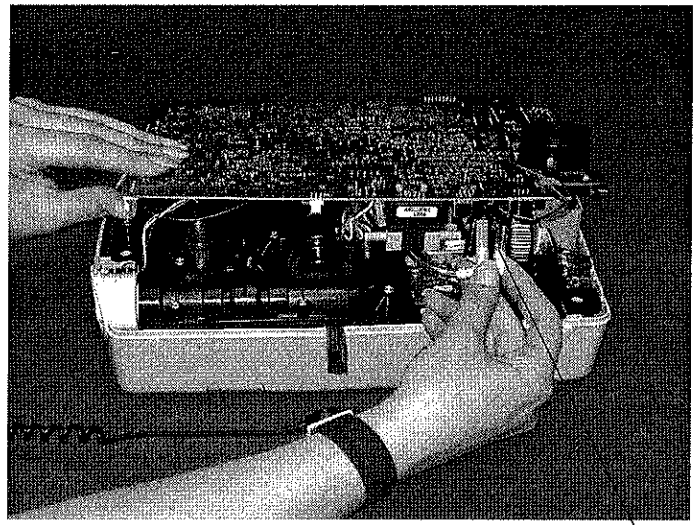



*Figure 6-18*
*Pressure Tubing Removal*

*Pressure Tubing Replacement (Continued)*

*Step 1 Removing the Top Enclosure Assembly*

Remove
- three screws
- top enclosure
- control pad ribbon cable and display assembly ribbon cable connectors

(See Section 6.4.5, step 1, for more detailed instructions on removing the top enclosure assembly.)

*Step 2 Removing the Main PCA (Partial)*

**NOTE:** The pressure tubing can be removed from the Main PCA without disconnecting the blower, power supply and temperature connections. Care should be taken during the process not to damage the Main PCA, blower assembly, or power supply PCA.

Remove
- five screws
- mass flow sensor tubing
- pressure tubing

(See Section 6.4.5, step 1, for more detailed instructions on removing the Main PCA.)

*Step 3 Removing the Pressure and Mass Flow Sensor Tubing from the Blower Assembly*

a. Disconnect the two pieces of 9" mass flow sensor tubing from the pressure ports on the blower assembly.

b. Disconnect the 5" pressure tubing from the pressure port on the blower assembly.

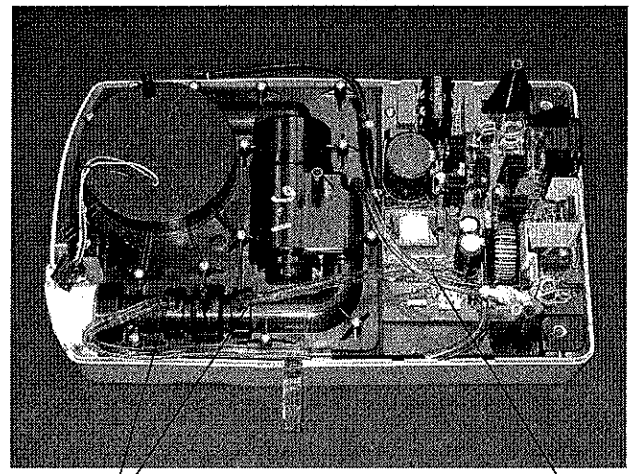



***Figure 6-19***
***Removing the Pressure tubing and Mass Flow Tubing***

*Pressure Tubing Replacement (Continued)*

*Step 4 Installing the Pressure and Mass Flow Sensor Tubing on the Blower Assembly*

a. Attach the 5" pressure tubing to the pressure port on the blower assembly.

b. Attach the two 9" pieces of mass flow sensor tubing to the pressure ports on the blower assembly.

*Step 5 Installing the Main PCA (Partial)*

Install:
- pressure tubing
- mass flow sensor tubing
- five screws

(See Section 6.4.5 for more detailed instructions on installing Main PCA.)

*Step 6 Installing the Top Enclosure Assembly*

Install:
- control pad ribbon cable and display assembly ribbon cable connectors
- top enclosure
- three screws

(See section 6.4.5, step 4, for more detailed instructions on installing the top enclosure assembly.)

## 6.4.7 Outlet Port Replacement

### Replacement Part Number 1003524

| Included in Kit: | Tools Required: |
|---|---|
| Outlet port<br>Outlet port seal | Phillips screwdriver No#2 (medium) |

### Procedure

Removed / Installed During Process:

- Top enclosure assembly
- Outlet port

**WARNING:** Electrical shock hazard: Disconnect the electrical supply before attempting to make any repairs to the device.

**CAUTION:** Electronic components used in this device are subject to damage from static electricity. Repairs made to this device must be performed only in an antistatic, ESD-protected environment.

*Figure 6-19*
*Outlet Port*

*Outlet Port Replacement (Continued)*

*Step 1 Removing the Top Enclosure Assembly*

Remove
- three screws
- top enclosure
- control pad ribbon cable and display assembly ribbon cable connectors

(see Section 6.4.5 step 1, for more detailed instructions on removing the top enclosure assembly.)

*Step 2 Removing the Outlet Port*

a. Remove the outlet port and the outlet port seal from the blower outlet by lifting upwards until the outlet port clears the bottom enclosure and pulling it straight out from the blower.

***Figure 6-20***
***Removing the Outlet Port***

*Outlet Port Replacement (Continued)*

*Step 3 Installing the Outlet Port*

a. Grasp the blower assembly and slightly lift the enclosure insert to allow the outlet port and outlet port seal to clear the bottom enclosure and be inserted into the blower outlet.

b. Slowly lower the enclosure insert assembly into the bottom enclosure while ensuring that the outlet port is properly seated in the bottom enclosure. Note that the pressure fitting on the outlet port must point towards the middle of the bottom enclosure.

*Step 4 Installing the Top Enclosure Assembly*

Install:
- control pad ribbon cable and display assembly ribbon cable connectors
- top enclosure
- three screws

(See Section 6.4.5, step 4, for more detailed instructions on installing the top enclosure assembly.)

## 6.4.8 Blower Assembly Replacement

**CAUTION:** Due to required testing after replacement, this item is only replaceable at a Respironics Service Center equipped with a Multi Function Calibration Station.

**Replacement Part Number 622187**

| Included in Kit: | Tools Required: |
|---|---|
| Blower Assembly (w / foam baffle) | Phillips screwdriver No#2 (medium) |
| Blower-to-enclosure insert seal | Torque wrench (in-lbs.) |
| Flow element / Flow Averaging Rings | |
| 6-13 x 1" screw (x15) | |

### Procedure

Removed / Installed During Process:

- Top enclosure assembly
- Main PCA
- Pressure tubing / Mass flow sensor tubing
- Outlet port
- Blower assembly
- Flow element / Flow averaging rings
- Blower-to-enclosure insert seal

**WARNING:** Electrical shock hazard: Disconnect the electrical supply before attempting to make any repairs to the device.

**CAUTION:** Electronic components used in this device are subject to damage from static electricity. Repairs made to this device must be performed only in an antistatic, ESD-protected environment.

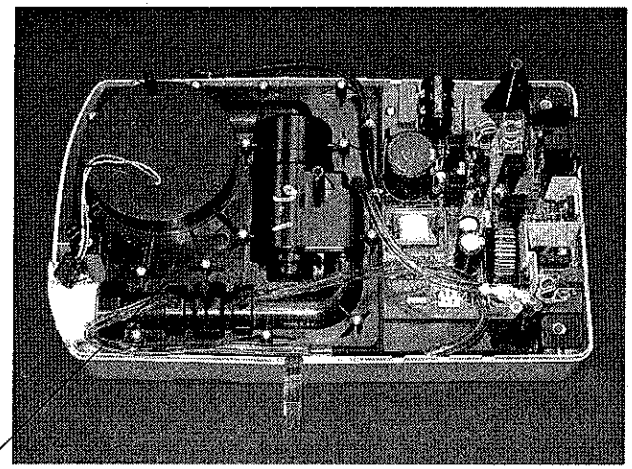



*Figure 6-21*
*Blower Assembly*

*Blower Assembly Replacement (Continued)*

*Step 1 Removing the Top Enclosure*

Remove
- three screws
- top enclosure
- control pad ribbon cable and display assembly ribbon cable connectors

(See Section 6.4.5, step 1, for more detailed instructions on removing the top enclosure assembly.)

*Step 2 Removing the Main PCA*

Remove:
- five screws
- blower wire connector
- power supply connector
- valve assembly connector
- temperature circuit connector
- $O^2$ wire harness connector
- pressure tubing
- mass flow sensor tubing
- Main PCA

(See Section 6.4.5 for more detailed instructions on removing the Main PCA.)

*Step 3 Removing the Pressure Tubing*

Remove:
- mass flow sensor tubing
- pressure tubing

(See Section 6.4.7 for more detailed instructions on removing the pressure and mass flow sensor tubing.)

*Step 4 Removing the Outlet Port*

Remove
- outlet port

(See Section 6.4.7 for more detailed instructions on removing the outlet port.)

*Blower Assembly Replacement (Continued)*

*Step 5 Removing the Blower Assembly*

a. Using a Phillips screwdriver, remove the 15 screws securing the blower assembly to the enclosure insert.

b. Lift the blower assembly up from the enclosure insert.

c. Note the location and routing of the valve assembly wires.

d. Remove the valve assembly form the enclosure insert.

e. Remove the flow element from the enclosure insert.

f. Remove the flow averaging rings from the enclosure insert.

g. Remove the blower-to-enclosure insert seal from the enclosure insert.

h. Remove the temperature circuit form the enclosure insert.

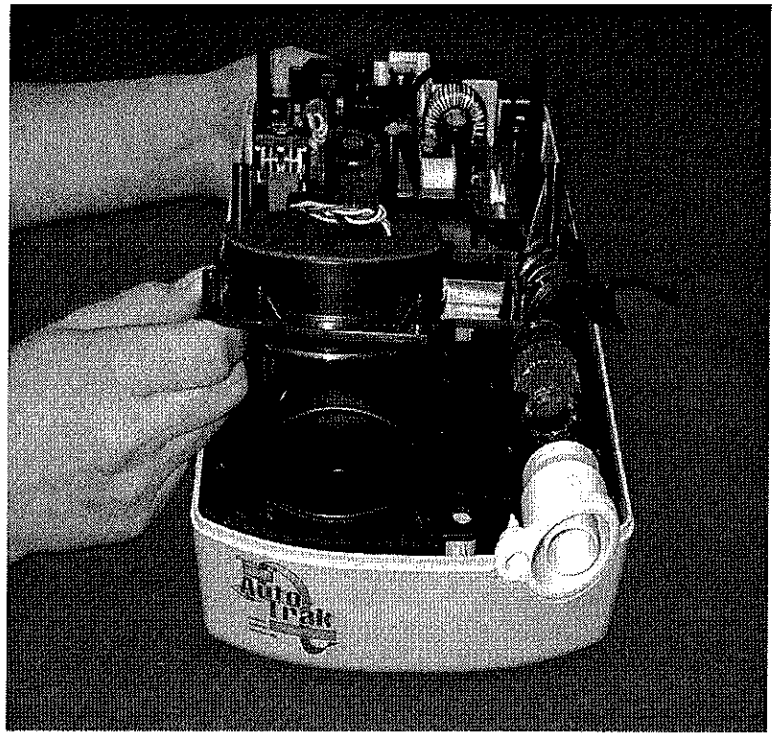



***Figure 6-23***
***Removing the Blower Assembly***

*Blower Assembly Replacement (Continued)*

*Step 6 Installing the Blower Assembly*

a. Position the temperature circuit so the sensor is in the middle of the flow path.

a. Position the blower-to-enclosure insert seal in place on the enclosure insert.

b. Ensure that the valve assembly and flow element are correctly positioned.

c. Ensure that the valve assembly wires are correctly positioned and routed.

d. Ensure that the flow element and flow averaging rings are positioned and facing in the proper direction.

e. Align the blower assembly with the holes in the enclosure insert, then set the blower assembly in place.

f. Insert and tighten the 15 screws provided to secure the blower assembly to the enclosure insert.

**NOTE:** The screws should be torqued to a maximum of 8 in-lbs. Excessive torque may cause the blower impeller to contact the enclosure insert.

*Step 7 Installing the Outlet Port*

Install
- outlet port

(See Section 6.4.7 for more detailed instructions on installing the outlet port.)

*Step 8 Installing the Pressure Tubing*

Install:
- pressure tubing
- mass flow sensor tubing

(See Section 6.4.6 for more detailed instructions on installing the pressure and mass flow sensor tubing.)

*Step 9 Installing the Main PCA*

Install:
- pressure tubing
- mass flow sensor tubing
- $O^2$ wire harness connector
- temperature circuit connector
- valve assembly connector
- power supply connector

*Blower Assembly Replacement (Continued)*

- blower wire connector
- Main PCA
- five screws

(See Section 6.4.5 for more detailed instructions on installing the Main PCA

*Step 10 Installing the Top Enclosure Assembly*

Install
- control pad ribbon cable and display assembly ribbon cable connectors
- top enclosure
- three screws

(See Section 6.4.5, step 4, for more detailed instructions on installing the top enclosure assembly.)

## 6.4.9 Valve Assembly Replacement

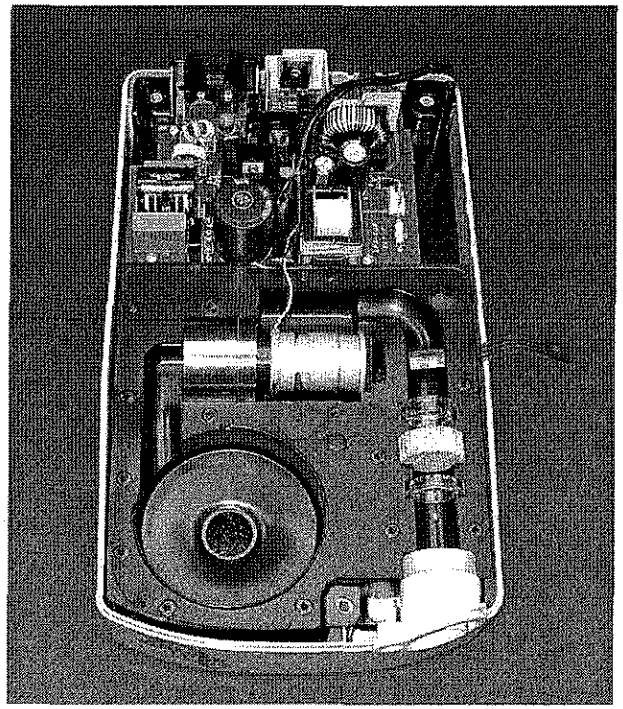
**Replacement Part Number 622242**

| Included in Kit: | Tools Required |
|---|---|
| Valve assembly<br>Blower-to-enclosure insert seal<br>Flow element / Flow averaging rings | Phillips screwdriver No 2 (medium) |

### Procedure

Removed / Installed During Process:

- Top enclosure assembly
- Main PCA
- Blower assembly
- Valve assembly
- Flow element / Flow averaging rings
- Blower-to-enclosure insert seal
- Temperature circuit



Valve Assembly
(under Blower Assembly)

*Figure 6-24*
*Valve Assembly*

*Valve Assembly Replacement (Continued)*

*Step 1 Removing the Top Enclosure Assembly*

Remove:
- three screws
- top enclosure
- control pad ribbon cable and display assembly ribbon cable connectors

(See Section 6.4.5, step 1, for more detailed instructions on removing the top enclosure assembly.)

*Step 2 Removing the Main PCA*

Remove
- five screws
- blower wire connector
- power supply connector
- valve assembly connector
- temperature circuit connector
- $O_2$ wire harness connector
- pressure tubing
- mass flow sensor tubing
- Main PCA

(See Section 6.4.5 for more detailed instructions on removing the Main PCA.)

*Step 3 Removing the Blower Assembly*

Remove:
- fifteen screws
- blower assembly
- valve assembly
- flow element
- flow averaging rings
- blower-to-enclosure insert seal
- temperature circuit

(See Section 6.4.8 for more detailed instructions on removing the blower assembly.)

*Valve Assembly Replacement (Continued)*

*Step 4 Removing the Valve Assembly*

a. Remove the valve assembly by lifting it out of the enclosure insert.

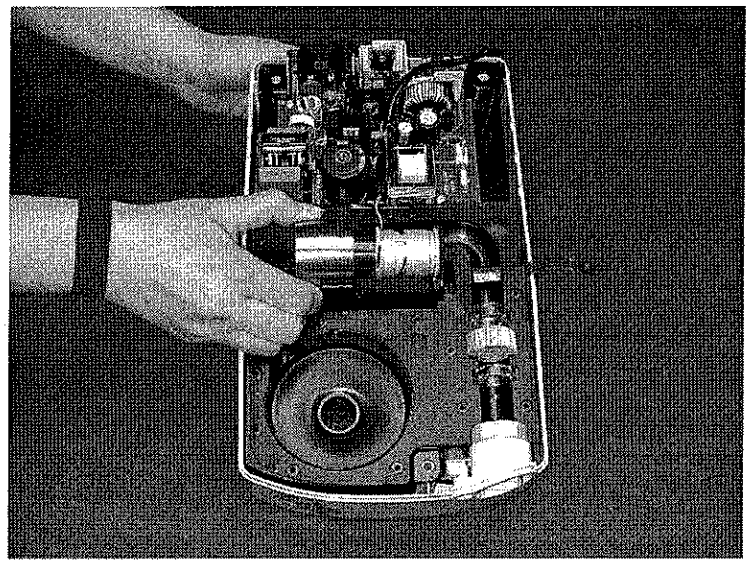


***Figure 6-25***
***Removing the Valve Assembly***

*Step 5 Installing the Valve Assembly*

a. Position the temperature circuit so the sensor is in the middle of the flow path.

b. Ensure that the rubber seal is correctly seated on the end of the valve assembly.

c. Place the valve assembly into its correct position in the enclosure insert.

**NOTE:** The valve assembly wires should be positioned at 3 and 9 o'clock in relation to the enclosure insert and should not block the pressure port.

*Step 6 Installing the Blower Assembly*

Install:

- blower-to-enclosure insert seal
- flow element / flow averaging rings
- valve assembly
- blower assembly
- fifteen screws

(See Section 6.4.8 for more detailed instruction on installing the blower assembly.)

*Valve Assembly (Continued)*

*Step 7 Installing the Main PCA*

Install:

- pressure tubing
- mass flow sensor tubing
- $O_2$ wire harness connector
- temperature circuit connector
- valve assembly connector
- power supply connector
- blower wire connector
- Main PCA
- five screws

(See Section 6.4.5 for more detailed instructions on installing the Main PCA.)

*Step 8 Installing the Top Enclosure Assembly*

Install:

- control pad ribbon cable and display assembly ribbon cable connectors
- top enclosure
- three screws

(See Section 6.4.5 for more detailed instructions on installing the top enclosure assembly.)

## 6.4.10 Flow Element and Flow Averaging Rings Replacement

**NOTE:** Flow Element and Flow Averaging Rings are included in the following RP Kits:
**Replacement Part Number 1003521**
**Replacement Part Number 1003516**

**WARNING:** Electrical shock hazard: Disconnect the electrical supply before attempting to make any repairs to the device.

**CAUTION:** Electronic components used in this device are subject to damage from static electricity. Repairs made to this device must be performed only in an antistatic, ESD-protected environment.

### Procedure

Removed / Installed During Process:

- Top enclosure assembly
- Main PCA
- Blower assembly
- Valve assembly
- Flow Element
- Flow Averaging Rings
- Blower-to-enclosure insert seal

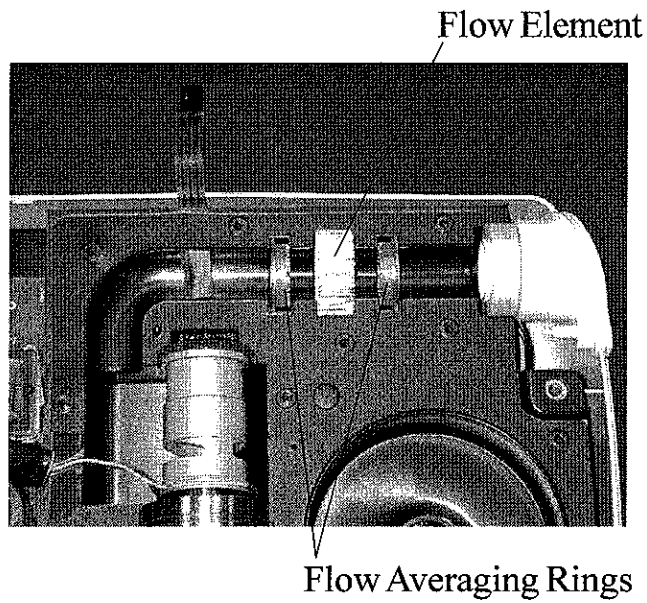



***Figure 6-26***
***Flow Element / Flow Averaging Rings***

*Flow Element / Flow Averaging Rings Replacement (Continued)*

*Step 1 Removing the Top Enclosure Assembly*

Remove:
- three screws
- top enclosure
- control pad ribbon cable and display assembly ribbon cable connectors

(See Section 6.4.5, step 1, for more detailed instructions on removing the top enclosure assembly.)

*Step 2 Removing the Main PCA*

Remove
- five screws
- blower wire connector
- power supply connector
- valve assembly connector
- temperature circuit connector
- $O_2$ wire harness connector
- pressure tubing
- mass flow sensor tubing
- Main PCA

(See Section 6.4.5 for more detailed instructions on removing the Main PCA.)

*Step 3 Removing the Blower Assembly*

Remove:
- fifteen screws
- blower assembly

(See Section 6.4.8 for more detailed instructions on removing the blower assembly.)

*Step 4 Removing the Valve Assembly*

Remove
- valve assembly

(See section 6.4.9 for more detailed instructions on removing the blower assembly.)